REMARKS

After entry of this response, claims 31-34, 36-40, 51-58, 61, 63, 64 and 67-78 remain pending and claims 35, 59, 60, 62, 65 and 66 are canceled in the present application. Applicant respectfully request reconsideration by the Examiner in light of previously presented amendments and the following remarks.

The Applicants would like to thank Examiner Chen for extending the courtesy of the interview on November 17, 2004 to discuss the above identified application and the pending claims. The Applicants acknowledge the content of the interview summaries (Form PTOL-413) prepared by the Examiner, dated November 17, 2004. Furthermore, the following remarks include issues addressed by the Applicants in the interviews and may be considered as a record of the substance of the interviews, supplementing the interview summaries prepared by the Examiner.

The Examiner has objected to claim 31 due to grammar informalities. The Applicants have amended the claim to correct this informality by moving the transitional phrase "the method comprising the steps of" to be positioned before recitation of the composition limitations. It is noted that such amendment does not narrow the scope of the claim and was solely done to correct a grammar informality.

In the present office action, the Examiner has also rejected claims 31-40 and 51-78 either under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,110,483 (Whitbourne et al.) or under 35 U.S.C. § 103(a) as being unpatentable over Whitbourne. The Examiner has suggested that Whitbourne teaches the "polymeric butylmethacrylate" as disclosed in the present application. The Applicant respectfully traverses the Examiner's suggestion and asserts that Whitbourne fails to disclose all of the limitations of the claims of the present application.

"For a prior art reference to anticipate in terms of 35 U.S.C. § 102, every element of the claimed invention must be identically shown in a single reference." In re Bond, 910 F.2d 831, 15 U.S.P.Q.2d 1566, 1567 (Fed. Cir. 1990) "Anticipation under 35 U.S.C. § 102 (b) requires the presence in a single prior art disclosure of each and every element of a Claimed invention...". Electro Medical

Systems, S.A. v. Cooper Life Sciences, Inc., 34 F.3d 1048, 32 U.S.P.Q.2d 1017, 1019 (Fed. Cir. 1994) "[O]ne who seeks such a finding must show that each element of the Claim in issue is found, either expressly or under principles of inherency, in a single prior art reference, or that the Claimed invention was previously known or embodied a single prior art device or practice." Minnesota Mining & Manufacturing Co. v. Johnson & Johnson Orthopaedics, Inc., 976 F.2d 1559, 24 U.S.P.Q.2d 1321, 1326 (Fed. Cir. 1992).

With regards to a rejection pursuant to 35 U.S.C. §103, the Examiner bears the initial burden in establishing a prima facie case of obviousness when rejecting claims under 35 U.S.C. §103. In re Piasecki, 745 F.2d 1468, 223 USPQ 758 (Fed. Cir. 1985); In re Reuter, 651 F.2d 751, 210 USPQ 249 (CCPA 1981). If the Examiner does not produce a prima facie case, the applicant is under no obligation to submit evidence of non-obviousness.

To properly establish a prima facie case of obviousness, MPEP § 706.02(j) identifies three basic criteria that must be met. First, the prior art reference (or references when combined) must teach or suggest all of the claim limitations. Second, there must be some suggestion or motivation in the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify the reference or combine reference teachings. Finally, there must be a reasonable expectation of success. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

As previously mentioned, the claims of the present application provide claim limitations that are not disclosed or suggested in Whitbourne et al. and therefore the criteria for a rejection pursuant to 35 U.S.C. §102(b) and §103(a) have not been satisfied. For example, independent claim 31 (and the related dependent claims) include limitations of "a composition comprising a bioactive agent in combination with a plurality of hydrophobic polymers, including a first polymer component comprising at least one poly(alkyl)(meth)acrylate having alkyl chain lengths from 2 to 8 carbons and a second polymer component comprising poly(ethylene-co-vinyl acetate) having vinyl acetate concentrations of between about 10% and about 50% by weight". More specifically, Whitbourne et al. does not disclose

poly(alkyl)(meth)acrylates or a composition that includes a combination of at least two hydrophobic polymers being, 1) at least one polyalkyl(meth)acrylate, and 2) poly(ethylene-co-vinyl acetate).

Whitbourne et al. generally discloses a coating that includes a "stabilizing polymer" capable of entrapping an active agent within. The "stabilizing polymer" may be selected from a large group of materials, including cross-linkable acrylic monomers, such as "methylmethacrylate, butylmethacrylate isobutylmethacrylate...." See Col. 2, lines 19-21. Whitbourne further indicates that the preferred acrylic "stabilizing polymers" may be cross-linkable acrylics with at least one component containing carboxyl, hydroxyl, amide or methylol groups (functional groups), thereby suggesting that the specific acrylics identified may include such functional groups or have such functional groups added to them. See Col. 3, lines 33-36 and Col 6, lines 5-11. This definition is further established by Examples 1-22, which predominantly include in many of the examples an acrylic polymer that has functional groups. Finally, Whitbourne generally states that the functional groups are desired to act as reactive groups or points of reactivity that are cross-linkable to form a cross-linked matrix or are able to form attractive forces such as hydrogen bonding toward the medical device. See Col 6, lines 28-47. The relevance of functional groups is not surprising due to the cross-linkable characteristics of the coatings in Whitbourne and the emphasis placed on crosslinking and/or reacting the polymers described in Whitbourne.

As previously mentioned, Whitbourne fails to disclose or suggest a number of limitations of the pending claims of the present application. The Examiner has suggested in the Office Action that Whitbourne discloses a combination of stabilizing polymers such as polybutylmethacrylate and polyethylene-co-vinyl acetate. However, Whitbourne does not disclose or suggest a polyalkyl(meth)acrylate anywhere in its specification. Moreover, there is no reference or suggestion anywhere in Whitbourne that the "stabilizing polymer" may be a polyalkyl(meth)acrylate (e.g. polybutylmethacrylate). For a further explanation of polyalkyl(meth)acrylates Applicant has enclosed with this response an Affidavit of Dr. Aron Anderson, which further explains polyalkyl(meth)acrylates. While Whitbourne identifies that a "stabilizing polymer" is cross-linkable and "may be a crosslinkable acrylic selected from methylmethacrylate, butylmethacrylate, isobutylmethacrylate...", these disclosed

acrylics are not the polyalkyl(meth)acrylate polymers as disclosed in the present invention and Whitbourne does not disclose or suggest the utilization of such polyalkyl(meth)acrylates. Furthermore, as previously suggested, Whitbourne discloses or suggests that such acrylics should include functional groups, such as carboxyl, hydroxyl, amide or methylol groups. The citing of such "stabilizing polymers" in Whitbourne is understandable since polymers including the monomers disclosed and acrylics having functional groups would have enhanced crosslinking and reaction capabilities.

Moreover, the Applicants of Whitbourne disclaim the polyalkyl(meth)acrylates claimed in the present application and their function in the corresponding file history of U.S. Patent No. 6,110,483. In the Whitbourne file history, the Whitbourne Applicants define crosslinkable and/or crosslinked acrylic polymers. The Applicants in Whitbourne differentiated crosslinkable acrylic polymers from ethyl and methyl methacrylate (i.e. polyalkyl(meth)acrylates) by stating that the cited reference (U.S. Patent No. 5,525,348) did not teach any crosslinked or crosslinkable acrylic polymers but merely recites that "acrylic polymers such as ethyl and methyl acrylate and methacrylate" may be used. The Applicants in Whitbourne further explained that a crosslinkable acrylic polymer was a co- or ter-polymer of acrylic monomers with at least one component containing carboxy, hydroxy, amide or methylol groups (i.e. acrylic acid or hydroxyethyl acetate). See page 6, lines 23-28 and page 7 lines 1-6 of the September 24, 1999, Office action Response in the Whitbourne File History (U.S. Patent No. 6,110,483), a copy of which is enclosed. Polyalkyl(meth)acrylates inherently do not include such reactive groups and therefore are not disclosed or suggested in the cited Whitbourne reference. Since Whitbourne does not disclose or suggest the utilization of polyalkyl(meth)acrylates as claimed in the present application, all of the limitations of the present claims have not been met.

Additionally, Whitbourne et al. fails to disclose a composition that includes a combination blend of at least two hydrophobic polymers including, 1) at least one polyalkyl(meth)acrylate, and 2) a poly(ethylene-co-vinyl acetate). See the attached affidavits from Dr. Aron Anderson regarding the advantages related to this hydrophobic polymer blend versus hydrophilic polymers and the property advantages of the hydrophobic polymer blend claimed in the present

application. While Whitbourne may disclose a combination of various polymers, it fails to disclose the combination blend of the above-identified polymers claimed in the present application. Furthermore, Whitbourne fails to disclose or suggest a combination comprising a bioactive agent blended with a plurality of stabilizing polymers. The coatings that include the combination blend of polymers identified in the present application have been found to possess a variety of beneficial characteristics that differ from other coatings known in the art and utilized for the same or similar applications.

The balancing of durability, flexibility and optimum release of bioactive agents in the field of biomedical polymeric coatings has been difficult to obtain. It has been found by the Applicants that the combination of polyalkyl(meth)acrylates and poly(ethylene-co-vinyl acetate) provides unexpected benefits that many coatings utilized for similar applications have not been able to obtain, such as durability (e.g. the resistance to abrasion), flexibility (e.g. prevention from cracking) and the optimum release of bioactive agents.

Test results of comparable coatings consisting of polybutylmethacrylate (pBMA) and poly(ethylene-co-vinyl acetate) (pEVA), each administered separately to stents as a single polymer coating, provided results that were satisfactory for some of the above identified properties, but not for all. It was found that control coatings that were made up entirely of pBMA are very durable showing no signs of wear during durability tests. However, such pBMA coatings developed cracks during flexibility tests and also released drug very slowly. See the Specification at page 24, lines 1-4. Alternatively, control coatings made up entirely of pEVA were found to show no signs of cracking during flexibility testing. However, such pEVA coatings were less durable and provided relatively rapid release of drug, usually releasing more than 50% of the total within 24 hours. See the Specification at page 24, lines 5-8. It is noted that optimum drug release is usually determined by coatings that release less than 50% of the total in 24 hours and preferably continue releasing drug for a period at least 30 days, depending upon the application. In comparison, the polymer combination blend of the present invention displayed no signs of abrasion or cracking following durability and flexibility testing and was capable of controlled adjustment of the rate of drug release based upon the relative concentration of pEVA. See the Specification at page

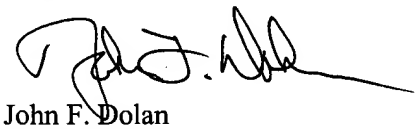
24, lines 9-17. Therefore, it can be concluded that the combination blend of the present invention provides a balance of beneficial characteristics not found in the art.

Based upon the previous paragraphs identifying Whitbourne's failure to disclose or suggest all of the limitations of the present claims, Applicants respectfully request that the rejection under §102(b) and §103(a) be withdrawn and that the pending claims be allowed.

In view of the foregoing, it is submitted that this application is in condition for allowance. Favorable consideration and prompt allowance of the application are respectfully requested.

The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

Respectfully submitted,



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CERTIFICATE OF MAILING

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December 8, 2004
Date of Deposit

Joleen R. Krueger

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re PATENT APPLICATION OF:

Applicant:	WHITBOURNE et al.		
Serial No.	08/880,512	Technology Center:	1616
Filing Date:	June 23, 1997	Examiner:	M. Williamson
For:	ADHERENT, FLEXIBLE HYDROGEL AND MEDICATED COATINGS		
Atty. Docket No.	32286-144519 (Formerly STSBI 0029)		

September 24, 1999

Assistant Commissioner for Patents
Washington, D.C. 20031

PRELIMINARY AMENDMENT

Sir:

Please enter the following preliminary amendment in the Continuing Prosecution Application submitted herewith.

IN THE CLAIMS

Please amend the claims as follows:

1. (Twice Amended) A coating applied to a surface of a medical device, the coating comprising:

(a) a stabilizing polymer [other than a cellulose ester] selected from the group consisting of polymers based on cross-linkable acrylic and methacrylic polymers crosslinked with a crosslinker, ethylene acrylic acid copolymers, styrene acrylic copolymers, [vinyl polymers and copolymers] polyvinyl acetals, ethylene vinyl acetate copolymer, polyvinyl acetate, epoxy resins, amino resins, phenolic resins, copolymers thereof, and combinations; and

(b) an active agent selected from the group consisting of a hydrophilic polymer selected to interact with the stabilizing polymer so as to produce a lubricious hydrogel, a bioactive agent, and a combination,

the active agent being entrapped in the stabilizing polymer such that the coating adheres to the surface when dry and when wet, and remains coherent without cracking upon flexing of the surface.

17. (Twice Amended) A method for coating a medical device having an inert surface comprising:

applying to the surface a coating liquid comprising a stabilizing polymer [other than a cellulose ester] selected from the group consisting of polymers based on cross-linkable acrylic and methacrylic polymers, ethylene acrylic acid copolymers, styrene acrylic copolymers, [vinyl polymers and copolymers] polyvinyl acetals, ethylene vinyl acetate copolymer, polyvinyl acetate, epoxy resins, amino resins, phenolic resins, copolymers thereof, and combinations; and

applying a coating liquid comprising an active agent selected from the group consisting of a hydrophilic polymer selected to interact with the stabilizing polymer so as to produce a lubricious hydrogel, and a bioactive agent, and a combination, and

drying to remove liquids such that the crosslinkable acrylic and methacrylic polymers become crosslinked, the active agent is entrapped by the stabilizing polymer and the coating adheres to the surface when dry and wet, and remains coherent despite flexing of the surface.

22. (Twice Amended) A method for coating a medical device comprising a surface polymer selected from the group consisting of polymers based on cross-linkable acrylics, amino resins, phenolic resins, epoxy resins, [vinyl polymers] polyvinylacetals, ethylene vinyl acetate copolymer, polyvinylacetate, copolymers thereof, and combinations; the method comprising the steps of

(a) applying a coating liquid comprising a solvent capable of attacking the device surface, and an active agent selected from the group consisting of a hydrophilic polymer selected to interact with the surface polymer so as to produce a lubricious hydrogel, and a bioactive agent, and a combination, and

(b) drying the coating liquid such that the crosslinkable acrylics become crosslinked, the active agent is entrapped in the surface polymer and the coating adheres to

the surface when dry and wet, and remains coherent despite flexing of the medical device.

23. (Twice Amended) A kit for applying a coating to a medical device, comprising:

a liquid comprising a [non-cellulose-based] stabilizing polymer selected from the group consisting of polymers based on cross-linkable acrylic and methacrylic polymers crosslinked with a crosslinker, ethylene acrylic acid copolymers, styrene acrylic copolymers, [vinyl polymers and copolymers] polyvinylacetals, ethylene vinyl acetate copolymer, polyvinylacetate, epoxy resins, amino resins, phenolic resins, copolymers thereof, and combinations; and

a liquid comprising an active agent selected from the group consisting of a hydrophilic polymer selected to interact with the stabilizing polymer so as to produce a lubricious hydrogel, and a bioactive agent, and a combination,

the liquids being the same or separate, and the stabilizing polymer and the active agent being selected to produce on the medical device a coherent flexible coating that has wet and dry adhesion.

30. (Twice Amended) A medical device comprising a coating according to [any of claims] claim 1[, 2, 4, 7, 10, 14, 15 or 31].

33. (Amended) A medical device comprising a coating according to claim 1 having a combination of substrate coated with stabilizing polymer formulation selected from the group consisting of: (a) polyurethane coated with stabilizing polymer formulation selected from the group consisting of one or more of [hydroxyl function acrylic polymer, acrylic dispersion polymer,] styrene acrylic copolymer, and epoxy plus polyamide; (b) polyethylene coated with stabilizing polymer formulation selected from the group consisting of one or more of carboxyl function and hydroxyl function acrylic polymers plus melamine plus epoxy; (c) silicone with carboxyl function acrylic polymer plus epoxy resin; (d) polyvinylchloride coated with [stabilizing polymer formulation selected from the group consisting of one or more of hydroxyl function acrylic polymer and] polyvinylbutyral plus phenolic resin; (e) acetal coated with stabilizing polymer formulation selected from the group consisting of one or more of ethylene vinyl acetate copolymer and polyvinyl acetate

copolymer; (f) glass coated with ethylene acrylic acid copolymer plus melamine resin plus acrylic polymer plus hydroxyl function acrylic polymer; and (g) stainless steel coated with stabilizing polymer formulation selected from the group consisting of one or more of epoxy plus polyamide/ethylene acrylic acid copolymer, and acrylic polymer with carboxyl function plus epoxy resin.

34. (Amended) A coated medical device produced by the method of [any of claims] claim 17[, 18, 20, or 22].

35. (Amended) A coated medical device produced by applying a kit according to [any of claims] claim 23 [, 24, 28, or 29] to a surface of the device.

Please add the following new claims:

36. A coating applied to a surface of a medical device, the coating comprising:

(a) a stabilizing polymer selected from the group consisting of polymers based on cross-linkable acrylic and methacrylic polymers, ethylene acrylic acid copolymers, styrene acrylic copolymers, polyvinyl acetals, ethylene vinyl acetate copolymer, polyvinyl acetate, epoxy resins, amino resins, phenolic resins, copolymers thereof, and combinations; and

(b) an active agent selected from the group consisting of a hydrophilic polymer selected to interact with the stabilizing polymer so as to produce a lubricious hydrogel, a bioactive agent, and a combination,

the active agent being entrapped in the stabilizing polymer such that the coating adheres to the surface when dry and when wet, and remains coherent without cracking upon flexing of the surface.

37. A coating according to claim 36, in which the stabilizing polymer has at least one component selected from the group consisting of acrylic with carboxyl, hydroxyl, amide, or methylol functional groups.

38. A coating according to claim 36, in which the surface of the medical device

comprises a material selected from the group consisting of stainless steel, nickel, gold, chrome, nickel titanium alloy, platinum, another metal, silicone, polyethylene, other polyolefins, polyamide, polyesters, other plastics, glass, polyurethane, acetal, and polyvinyl chloride.

39. A coating according to claim 36, wherein the medical device is selected from the group consisting of needles, guide wires, catheters, surgical instruments, equipment for endoscopy, wires, stents, angioplasty balloons, wound drains, wound dressings, arteriovenous shunts, gastroenteric tubes, urethral inserts, laparoscopic equipment, pellets, and implants.

40. A medical device comprising a coating according to claim 36 having a combination of substrate coated with stabilizing polymer formulation selected from the group consisting of: (a) polyurethane coated with stabilizing polymer formulation selected from the group consisting of one or more of hydroxyl function acrylic polymer, crosslinkable acrylic dispersion polymer, styrene acrylic copolymer, and epoxy plus polyamide; (b) polyethylene coated with stabilizing polymer formulation selected from the group consisting of one or more of carboxyl function and hydroxyl function acrylic polymers plus melamine plus epoxy; and (c) polyvinylchloride coated with stabilizing polymer selected from the group consisting of hydroxy function acrylic polymer and polyvinylbutyral plus phenolic resin.

REMARKS

Applicants respectfully request that the IDS submitted on May 27, 1999 be entered and considered in the prosecution of this Application.

Applicants thank the Examiner for the interview conducted September 8, 1999 and for the helpful suggestions. At the interview, the Examiner suggested that coatings comprising stabilizing polymers consisting of crosslinked acrylic and methacrylic polymers would be allowable. The Examiner further suggested that the remaining polymers as listed in Claim 1 and others are allowable as written.

Claims 1-2 and 4-30 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Whitbourne '009 in view of Whitbourne et al. '348. Although Applicants maintain that claims reciting cross-linkable acrylic and methacrylic polymers are allowable, amended claims are presented to facilitate prosecution. Independent composition claims 1 and 23 have been amended to recite acrylic and methacrylic polymers that are cross-linked and independent method claims 17 and 22 have been similarly amended to recite that the coatings consisting of cross-linkable acrylic and methacrylic acid that are cross-linked upon drying, consistent with the Examiners comments at the interview. These independent claims (1, 17, 22 and 23) have been further amended to more distinctly claim the invention and recite the specific vinyl polymers used in the Examples in the specification. Applicants respectfully submit that these amendments place claims 1-32, 34 and 35 are in condition for allowance.

Claim 33 has been amended to remove the coatings where the stabilizing polymer is cross-linkable acrylic polymer without crosslinker. At the interview, the Examiner suggested that the remaining combinations of Claim 33 are allowable because they are directed either to polymers other than cross-linkable acrylics or to cross-linkable acrylic polymers plus other compounds as shown in the specification at, for example, page 17 line 23 to page 18 line 8. Applicants respectfully submit that Claim 33 as amended is in condition for allowance.

New Claims 36-40 are directed to coatings, methods and devices with coatings that comprise crosslinkable acrylic and methacrylic polymers. These new claims are subsumed in the original claims and therefore supported by the specification. Applicants maintain that cross-linkable acrylic and methacrylic polymers are non-obvious in light of the disclosure of Whitbourne '009 and Whitbourne et al '342.

Applicants respectfully submit that the prior art Whitbourne et al. '348 does not teach any crosslinked or crosslinkable acrylic polymers but merely recites that "acrylic polymers such as ethyl and methyl acrylate and methacrylate" may be used. These polymers are not inherently crosslinkable in the absence of further functionalization or additional cross-linking agents; they are simple esters having neither a carboxy group nor any functional group in the ester chain. Applicant's respectfully submit that the use of cross-linkable acrylic and methacrylic polymers is not suggested by the prior art. The prior art also fails to provide a motivation to use the cross-linkable acrylic and methacrylic polymers of the present invention.

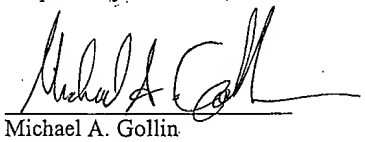
The difference between crosslinkable acrylic polymers and acrylic polymers in general is demonstrated, for example, in the CYMEL® 303 Crosslinking Agent product literature (submitted in an IDS dated June 16, 1998) where it states:

> Useful systems can be formulated . . . from co- or ter-polymers of acrylic monomers with at least one component containing carboxy, hydroxy, amide, or methylol groups (i.e. acrylic acid or hydroxyethyl acetate).

(emphasis added). Other product literature submitted in the IDS also emphasizes this difference by referring to "crosslinkable" acrylic polymers. Thus, the recitation in the '348 patent of "acrylic polymers such as ethyl and methyl acrylate and methacrylate" does not make the use of *crosslinkable* acrylic polymers obvious or provide a motivation to utilize cross-linkable acrylic polymers. Indeed, the only examples, ethyl and methyl acrylate and methacrylate – in contrast to polymers including acrylic acid and other functional groups – would not be crosslinkable without further modification and so the reference teaches away from the use of crosslinkable acrylic and methacrylic polymers. Applicants submit that Whitbourne et al. '348 does not disclose the use of other crosslinking agents in conjunction with these acrylates and does not suggest a crosslinkable acrylic polymer coating. Applicants therefore submit that new claims 36-40 are in condition for allowance.

Applicants respectfully submit that claims 1-40 are in condition for allowance and requests that the claims be allowed and the application passed to issue. If any questions relating to patentability remain unresolved, the Examiner is respectfully invited to telephone undersigned counsel for the purpose of resolving such questions.

Respectfully submitted,



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